



# Naval Medical Research and Development

## *Enterprise Laboratories*

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## News Releases

### Content Editor

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### NAMRU-SA Announces the Publication of Research on Novel Nanofibrous Scaffolds for Next Generation Antimicrobial Wound Dressing

Released: 11/15/2016

Story courtesy of NAMRU-SA Public Affairs



NAMRU-SA's original research demonstrates that that CS/PEO scaffolds with at least a 2: 1 mass ratio are well suited to serve as a foundation for the development of a next generation antimicrobial wound dressing. (Graphics courtesy of NAMRU-SA Public Affairs)

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SAN ANTONIO—Naval Medical Research Unit San Antonio (NAMRU-SA) recently published data in the *Journal of Nanomaterials* demonstrating that an electrospun chitosan (CS)/polyethylene oxide (PEO) scaffold is a promising candidate for wound dressing applications due to excellent antibacterial characteristics and biocompatibility.

“Battlefield wounds present a unique challenge due to extended evacuation times and non-endemic infections that often complicate the healing process,” says Mr. Tony Yuan, NAMRU-SA researcher and lead author. Ideal management of cutaneous wounds is predicated on the minimization of infection at the site of injury.

“Development of the active antibacterial scaffold presented in this study is critical in providing a platform for a new generation antimicrobial wound dressings,” says Capt. Jonathan Stahl, Principal Investigator and Head of NAMRU-SA’s Maxillofacial Injury and Disease Department.

### News Releases

NAMRU-3 Researchers Contributed to the Influenza Vaccination Selection for 2016

R & D Chronicles - The Mosquito Fighters, Part VIII: Malaria Control in the Pacific War

Deputy Assistant Secretary of Defense for Research Visits NHRC

Lightening the Load: The Science Behind Finding the Balance Between Combat Load, Survivability, Health, and Performance

NAMRU-3 Change of Command Ceremony Highlights the Importance of Collaboration

Rear Adm. Chinn, Defense Health Agency’s Director of Research Development and Acquisition Visits NAMRU-Dayton

NAMRU-SA Announces the Publication of Research on Novel Nanofibrous Scaffolds for Next Generation Antimicrobial Wound Dressing

U.S. Army and Navy Forces Collaborate with African Partners in the Fight against Malaria

NMRC and WRAIR Team Up to Launch Joint West Africa Research Group in Nigeria

R&D Chronicles: The Mosquito Fighters, Part VII - The Inimitable Dr. Stitt and the Navy Medical School

NAMRU San Antonio Participates in First Local Bioscience Research Database Website

Navy Surgeon General Conducts All Hands Call with Navy Research Unit in Cairo

Combat Artist Documents Navy Medicine Research and Development Activities at NAMRU-SA

NSMRL Hosts Young Scientists as Part of STEM Programs

Results showed the fabricated CS/PEO composite scaffolds had fiber diameters in the nanometer range, which increased with decreasing CS concentration. Higher CS concentrations contributed to an increase in both tensile strength and elasticity. The degradation of the scaffold demonstrated a biphasic profile that was unaffected by changes in concentration of polymer.

Additionally, a higher concentration of CS was successful in inhibiting both growth and attachment of *Staphylococcus aureus* bacteria. “This property could play an important role in wound dressing applications, where infection is often introduced through attachment and infiltration of bacteria during dressing changes,” says Yuan. Finally, the scaffolds had no effect on mammalian fibroblasts, which synthesize the structural framework for tissues and play a critical role in wound healing.

NAMRU-SA researchers have demonstrated that CS/PEO scaffolds are well suited to serve as a foundation for the development of a next generation bioactive wound dressing with the 2:1 mass ratio of CS/PEO having the most antibacterial properties.

Navy Medicine’s Deputy Chief  
Readiness, Health, Visits NHRC

Bacteriophage-based Therapy  
Overcame an *A. baumannii* Infection

NMRC’s Lt. Watters Competes in NATO  
Chess Tournament

NAMRU-SA Research Responds to the  
Specific Needs of Warfighters and  
Clinicians in Posters Sessions at  
MHSRS 2016

NMRC Commanding Officer Tours Bone  
Marrow Research Lab

Navy Medicine Patent Attorneys Provide  
Researchers Patent Process Seminar at  
NMRC

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